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FOR ADMINISTRATIVE USE

THE MANAGEMENT STATUS OF FOREST LANDS IN THE UNITED STATES



Preliminary Edition

U. S. Department of Agriculture - Forest Service

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The large amount of field work which provided the basic information for this report was carried out by the regional offices of the Forest Service with the cooperation of State foresters and other public and private agencies concerned with the management of forest lands.

Preliminary assembly and analysis of the field survey information was done by H. B. Wales and W. R. Hine. The report was prepared by V. L. Harper and James C. Rettie.

Lyle F. Watts

Chief, Forest Service

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THE MANAGEMENT STATUS OF FOREST LANDS IN THE UNITED STATES

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Introduction

Any comprehensive appraisal of the forest situation must include critical scrutiny of the quality of management that is being applied to the commercial forest lands of the country. To obtain basic data on the status of management, the Forest Service made a field survey early in 1945. The survey was specifically designed to supply information on the character of recent timber cutting practices and of fire control measures, and on the extent to which the larger forest properties, both public and private, are being managed on a sustained-yield basis.

Field work was done by personnel of the Forest Service with assistance by the staffs of State foresters and of other public and private agencies concerned with the management of forest lands. It involved complete coverage of publicly owned commercial forest lands and of large privately owned commercial forest lands, i.e., holdings of 50,000 acres and over. The remainder of the privately owned commercial forest land was covered by standard sampling methods. Some 42,000 small and medium-sized holdings, distributed to give a fair representation as to size of property and region, were examined.

Details of the criteria and methods of the survey are given in the sections of this report devoted to timber cutting practice, fire protection, and sustained yield. These and other sections include summary compilations of the data obtained and brief discussions of the forest-management situation. Further details are given in the Appendixes.

Timber Cutting Practices

Each fieldman was provided with a cutting practice guide designed to fit each major forest type in the area he was to cover. This guide set up a median standard of cutting practices for the type. It served as the bench mark for five cutting-practice ratings applicable in the evaluation of the cutting found on each property. Two ratings provided for recognition of practices which were better than those set up in the guide and two for practices which were inferior. Fair cutting is the median rating which corresponds, as nearly as can be judged, with the practices outlined in the guide. The five ratings defined in briefest form are as follows:

1. High-order cutting requires the best types of harvest cutting, which will build up and maintain quality and quantity yields consistent with the full productive capacity of the land. Wherever needed, it requires cultural practices, such as planting, timber-stand-improvement, cuttings, thinnings, and control of grazing. ^{1/}
2. Good cutting requires that the cut be made in accordance with the demands of good silviculture and that the land be left in possession of desirable species in condition for vigorous growth in the immediate future. It is substantially better than fair cutting and contains some of the elements of high-order cutting.
3. Fair cutting marks the beginning of cutting practices which will maintain on the land any reasonable stock of growing timber in species that are desirable and marketable.
4. Poor cutting leaves the land with a limited means for natural reproduction, often in the form of seed trees but sometimes only with seed on the ground. In second-growth forests, poor cutting robs the stand of minimum-size merchantable trees in stages of rapid growth. Such cutting often causes deterioration of species with consequent reduction in both quality and quantity of forest growth.
5. Destructive cutting leaves the land without timber values and without means for natural reproduction.

One of these ratings was given to each forest property covered in the survey. Occasionally a tract of land was found where fire, hurricane, or some other agent had obscured the cutting evidence to an extent that no rating could be given. Some other properties such as private estates and hunting areas showed no signs of recent cutting. There were also the remote areas of the national forests that still await access roads to open them for logging. All tracts of the types just mentioned were classified as nonoperating lands. They include about 13 percent of the total commercial forest acreage. ^{2/}

^{1/} - High-order cutting implies a very intensive silviculture as yet only in the initial stages of development in this country.

^{2/} - More information on the areas and ownership of nonoperating lands will be found in the section "Management Status of Commercial Forest Lands."

For the operating properties, the most recent cutting determined the cutting-practice rating. Usually it had occurred in the period 1941 to 1945, but occasionally it was necessary to base the rating on earlier cutting. The national forests and other large public and private holdings were rated by working circles.

After the logging done on each property or working circle had been assigned a cutting-practice rating (high-order, good, fair, poor, or destructive), it was given a "weight" corresponding to the number of acres of forest land in the property or working circle. ^{3/} It is obvious that a large logging operation is more significant than a small one and that any analysis based simply on the number of properties which fell in each cutting-practice class would not be meaningful. The weighting puts the large and the small jobs into perspective in a total picture. The term "percent of cutting" as used in this report thus means percent of the operating properties weighted by the number of acres contained therein. In some of the final consolidations of regions and ownership classes, the total forest acreage was used to avoid needless confusion of acreage figures in the final summary tables. The results thus obtained are essentially the same as would have been shown by retaining operating acreage as the weighting factor.

The first analysis of timber cutting practices is by ownership class as shown in table 1 and figure 1.

Only 23 percent of the cutting on all commercial forest lands rates good and high-order. Fifty-two percent of it rates poor and destructive.

The cutting practices on public lands are notably superior to those on private lands. The favorable status of cutting practices on the public lands (67 percent good to high-order) is reason for some gratification. These good practices will not, however, go very far in assuring the country an adequate future supply of timber. The public lands contain only about one-fourth of the commercial forest acreage and considerably less than that proportion of the potential timber-producing capacity. Even on the public lands there is much to be done in the improvement of cutting practices. Good to high-order

^{3/} This is only one of several methods that might be used, for example: weighting by volume of timber removed or by cut-over area. Such methods are, however, subject to some bias which is discussed in Appendix A. No one method can be entirely satisfactory from all points of view. The operating area method which was used is easiest to apply and certainly as fair as any that could have been used for all properties.

practices have not yet been attained in 25 percent of the cutting on western national forests. On other Federal lands the practices average considerably below present national-forest standards. On State and local government lands the cutting practices are also generally below the average quality found on the national forests.

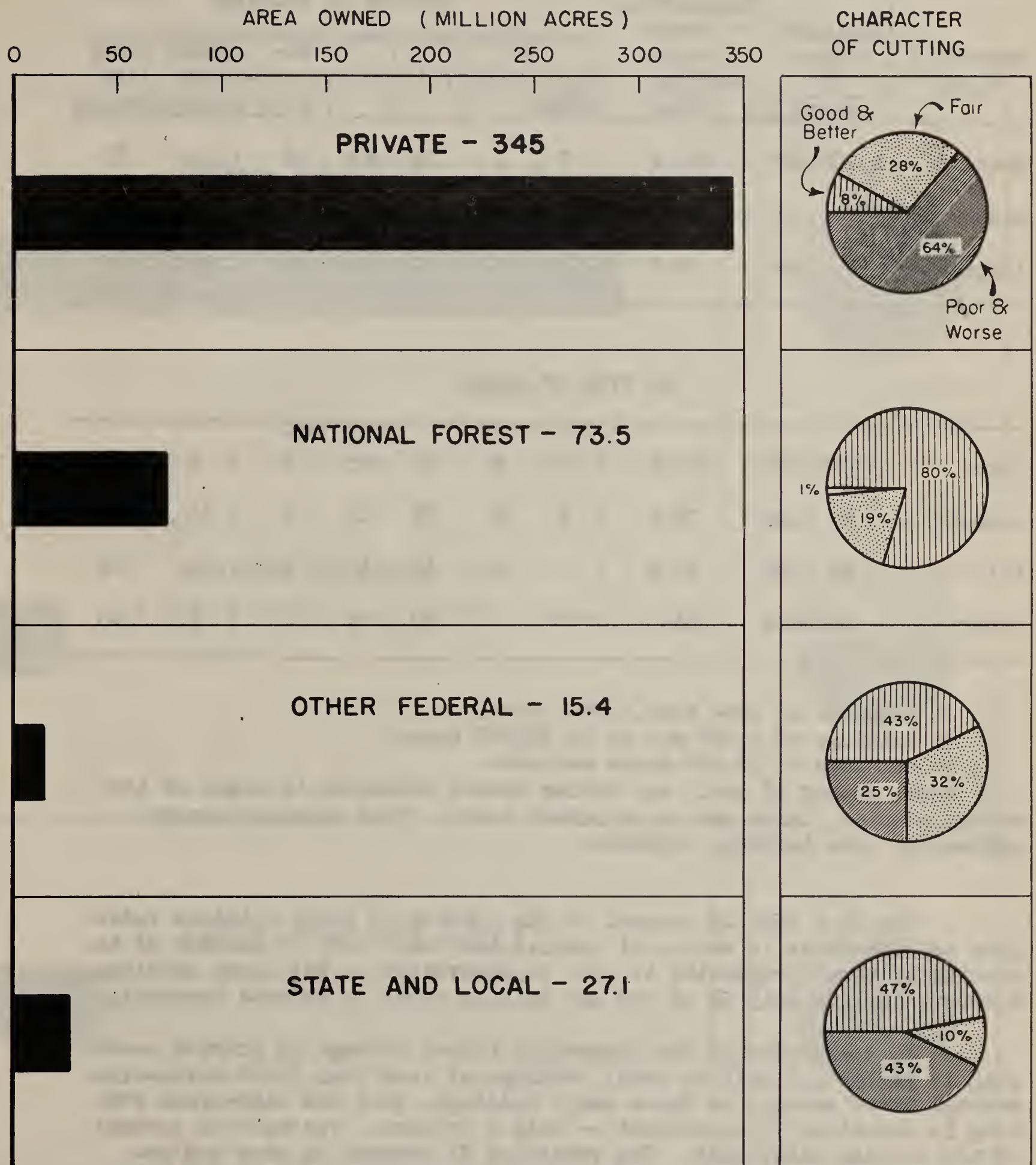
Table 1.—Character of timber cutting on commercial forest land

Ownership	:Commercial : :forest area: : million : acres	Percent of cutting							
		High- : order	Good	Fair	Poor	: De- : struc	: Good : and : better	: Poor : and : worse	
All lands	: 461.0	: 3	20	25	46	6	: 23	52	
Private	: 345.0	: 1	7	28	56	8	: 8	64	
Public	: 116.0	: 8	59	19	13	1	: 67	14	
National forests:	73.5	: 11	69	19	1	0	: 80	1	
Other Federal	: 15.4	: 6	37	32	24	1	: 43	25	
State & local	: 27.1	: 3	44	10	41	2	: 47	43	

It is, however, the privately owned lands that deserve most attention. They contain 75 percent of the commercial forest acreage. They contain much more than that proportion of the better site-class lands. Most of the privately owned timber is accessible. Until recently, something like 90 percent of the timber cut has come from the private lands. While this proportion will go down somewhat, the private lands will undoubtedly remain our principal source of timber products. The cutting practices on these lands have a crucial bearing upon the country's future supplies of timber.

The survey disclosed wide variations in the quality of cutting practices on private lands. Large owners, on the average, treat their lands better than do the small owners. Pulp companies and lumber companies do better cutting on their own lands than that done on farmers' woodlands and on those of other small owners. The general situation is shown in table 2 and figure 2.

FIGURE 1
CHARACTER OF TIMBER CUTTING ON COMMERCIAL
FOREST LANDS - BY OWNERSHIP CLASS



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Table 2.—Character of timber cutting on private lands

BY SIZE OF HOLDING

Ownership class	:	:Commercial:	Percent of cutting								
	:Estimated	: forest	:								
	: number	: area,	:	:	:	:	: De-	: Good	:Poor		
	: of	: million	:High-	:Good:	:Fair:	:Poor:	:struc-	: and	:and		
	: owners <u>4/</u>	: acres	:order:	:	:	:	: tive	:better:	:worse		
Small <u>1/</u>	4,200,000	: 261.4	: 0	4	25	63	8	: 4	71		
Medium <u>2/</u>	3,200	: 32.9	: 1	7	31	50	11	: 8	61		
Large <u>3/</u>	398	: 50.7	: 5	24	39	28	4	: 29	32		

BY TYPE OF OWNER

Farm	3,200,000	:	139.1	:	0	4	23	65	8	:	4	73
Lumber Co.	No data	:	36.6	:	6	19	27	42	6	:	25	48
Pulp Co.	No data	:	14.8	:	3	30	49	17	1	:	33	18
Other	No data	:	154.5	:	0	5	30	57	8	:	5	65

1/ In holdings of less than 5,000 acres.

2/ In holdings of 5,000 and up to 50,000 acres.

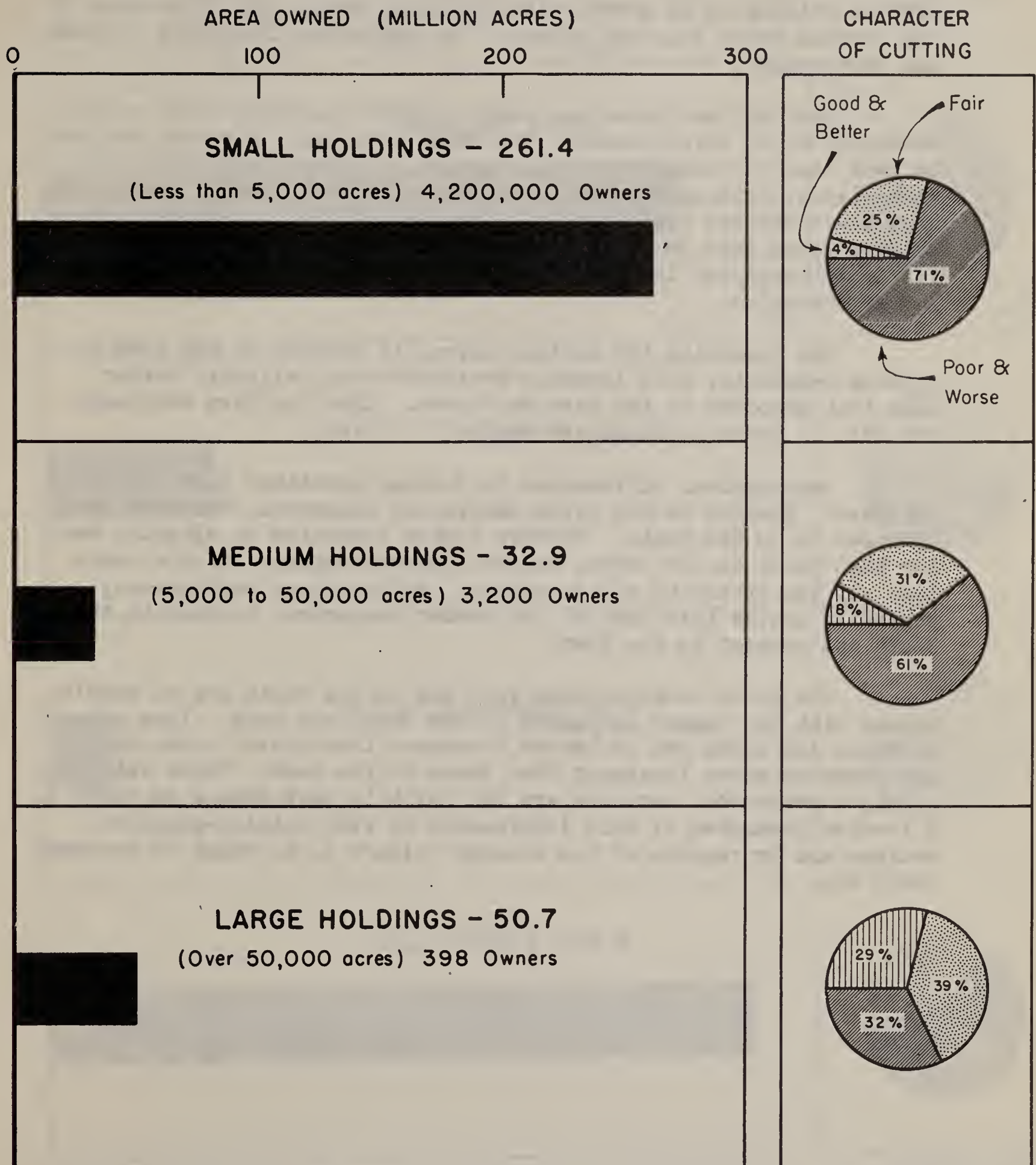
3/ In holdings of 50,000 acres and more.

4/ Total number of small and medium owners estimated by means of the survey sample. Large owners by actual count. Farm woodland owners estimated. See table 11, Appendix.

The fact that 29 percent of the cutting on large holdings rates good to high-order is worthy of special mention. Only 32 percent of the cutting on these properties is poor to destructive. The large holdings, however, include only 51 of the 345 million acres in private ownership.

Three-fourths of the commercial forest acreage in private ownership is in the 4.2 million small holdings of less than 5,000 acres--the average is 62 acres. On these small holdings, good and high-order cutting is practically nonexistent — only 4 percent. Twenty-five percent of the cutting rates fair. The remaining 71 percent is poor and destructive. Herein lies the hard core of the private woodland management problem.

FIGURE 2
CHARACTER OF TIMBER CUTTING ON PRIVATE FOREST LANDS
BY SIZE OF HOLDING



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Going further with the analysis of the cutting practices on private lands (see figure 3 and the lower section of table 2), it will be noted that 139 million acres of the commercial forest land, or 40 percent of that which is privately owned, is in farm woodlands. The number of owners is estimated at 3.2 million and the average size of holding is 43 acres. In this large area, only 27 percent of the cutting rates fair and better. The remaining 73 percent is poor and destructive.

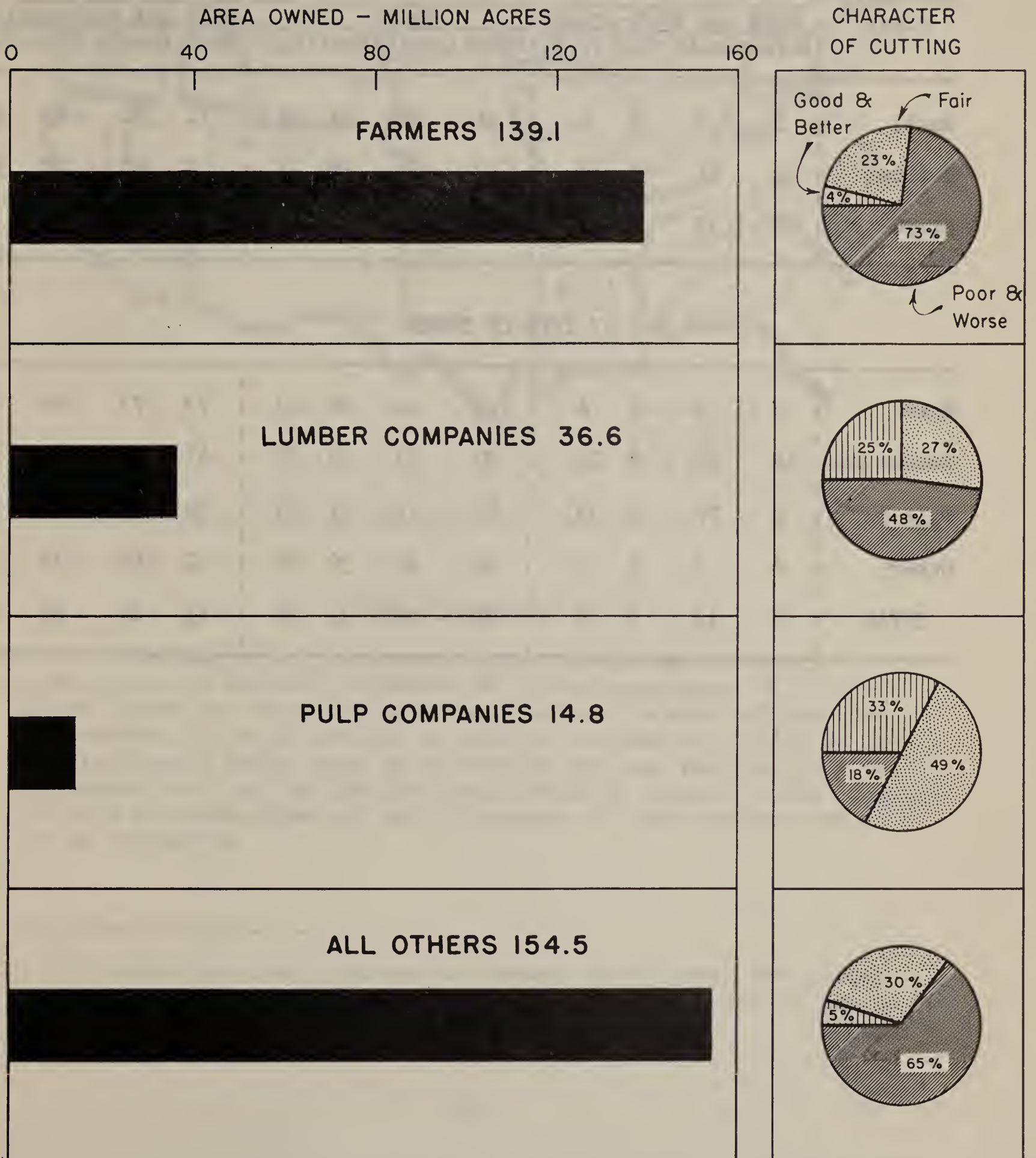
Most of the timberland held by lumber companies and by pulp companies is in large blocks. The total area held, however, amounts to less than 15 percent of total acreage in private ownership. On these lands, cutting practices are generally much better. Good and high-order ratings are given to 27 percent of the cutting. About 40 percent rates poor and destructive. The remaining 33 percent rates fair. Pulp-company lands get better treatment than those of the lumber companies.

The remaining 155 million acres, 45 percent of the area in private ownership, gets inferior treatment--only slightly better than that accorded to the farm woodlands. Like the farm woodlands, the bulk of these holdings are small.

Geographical differences in cutting practices have some interest. Insofar as the large owners are concerned, the best performance is in the South. Western lumber companies do slightly better than those in the North, but the lumber companies of the South lead all the others by a wide margin. Pulp-company performance, generally better than that of the lumber companies, is best in the South and poorest in the West.

The other nonfarm lands rate low in the South and on middle ground with the lumber companies in the North and West. Farm woodlands in the South get no better treatment than those in the North and somewhat worse treatment than those in the West. These ratings by major geographic sections are set forth in more detail in table 3. A further breakdown of this information by five cutting-practice ratings and by regions of the country (figure 4) is shown in appendix table 13.

FIGURE 3
CHARACTER OF TIMBER CUTTING ON PRIVATE FOREST LANDS
BY TYPE OF OWNER



REAPPRAISAL PROJ. - 1946

Table 3.—Character of timber cutting on private lands

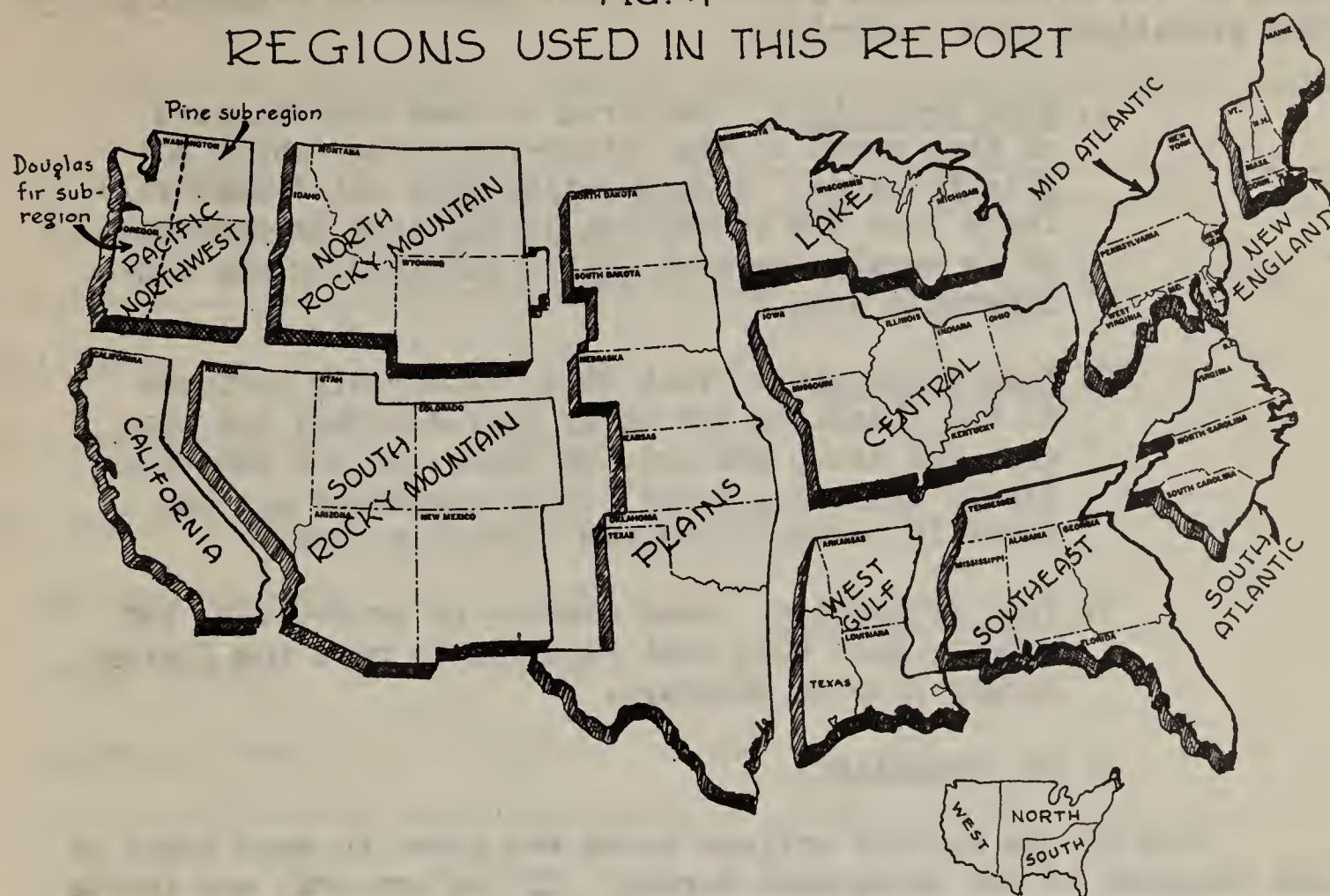
BY SIZE OF HOLDING

Ownership class	Percent of cutting											
	Good and high-order				Fair				Poor and destructive			
	North	South	West	U.S.	North	South	West	U.S.	North	South	West	U.S.
Small	5	2	3	4	24	24	32	25	71	74	65	71
Medium	4	11	3	8	47	26	29	31	49	63	68	61
Large	9	52	9	29	62	25	38	39	29	23	53	32

BY TYPE OF OWNER

Farm	5	3	4	4	22	24	28	23	73	73	68	73
Lumber Co.	12	43	8	25	27	23	33	27	61	34	59	48
Pulp Co.	8	77	0	33	72	12	54	49	20	11	46	18
Other	6	6	2	5	32	26	39	30	62	68	59	65
TOTAL	6	11	5	8	30	25	34	28	64	64	61	64

FIG. 4
REGIONS USED IN THIS REPORT



Fire Protection

Protection of the forest against damage or destruction by fire is one of the major elements of forest management. ^{4/} In this field, there has been much more progress than in cutting practices. In contrast to the 52 percent of poor to destructive cutting on commercial forest lands, only 29 percent of the area receives poor to no protection. As for private lands alone, 64 percent of the cutting is poor to destructive but only 37 percent of the area receives poor to no protection.

^{4/} Insects and tree diseases now destroy more timber, but protection against them is not yet developed to the extent that it can be rated.

In the management survey 5/ fire protection was rated on the basis of its effectiveness from the timber production standpoint. 6/ Four gradations were recognized:

1. Good protection. Required to meet the standard of that given to the better-protected public and private lands. A good rating does not necessarily imply that the protection is all that is desirable. It is merely the best so far attained on any considerable area.
2. Fair protection. That which reasonably conforms to the standards set up by Clarke-McNary Act program for state and private lands but not substantially exceeding them. These standards are defined in terms of maximum allowable burn.
3. Poor protection. Some measure of protection, but notably less than that required to meet the Clarke-McNary program standard.
4. No protection.

One of the ratings defined above was given to each tract of land examined in the management survey. If the property was inside an organized protection unit, it received the rating of that unit unless the owner had provided additional protection measures which warranted a higher rating. Lands outside of organized protection units were rated on the basis of the apparent fire record over the past several years and on the evident means of protection.

5/ The figures cited here differ somewhat from those contained in a parallel survey which was made in connection with the Clarke-McNary Act program. The differences are explained in Appendix B.

6/ Certain critical watershed areas need protection superior to that which is considered adequate for timber-growing purposes.

The status of protection by major ownership classes is shown in table 4.

Table 4.--Character of fire protection on commercial forest lands

Ownership class	: Commercial : forest area, : million acres	Percent in each protection grade			
		: Good	: Fair	: Poor	: None
All lands	461.0	36	35	19	10
All private lands	345.0	19	44	24	13
All public lands	116.0	84	11	4	1
National forests	73.5	98	1	1	0
Other Federal	15.4	54	25	17	4
State and local	27.1	66	28	4	2

Public lands are fairly well protected in comparison with private lands, which still have a long way to go to reach what is here called the good standard.

The critical problem lies in the privately owned lands and centers mainly in the southern regions. This is brought out in table 5, which gives a regional break-down of fire protection grades for privately owned lands.

Table 5.--Character of fire protection on private lands

Section	: Commercial : forest : area, : million : acres	Percent in each protection grade				
		: Good	: Fair	: Poor	: None	: Poor and : none : combined
North	139.6	22	60	12	6	18
South	167.0	7	35	37	21	58
West	38.4	64	27	9	0	9
United States	345.0	19	44	24	13	37

Details by regions and by ownership classes are given in appendix table 14. The Southeast is an important timber-growing region; yet 74 percent of the privately owned lands located there get little or no protection. The West Gulf region is only a little better protected. The Central States also rank poorly from the fire protection standpoint.

Sustained Yield

Too fast a rate of cutting, even under the better practices, can soon exhaust a supply of timber. The consequence is usually a drastic curtailment or a closing down of the dependent wood-using industry and disruption of the economic life of a whole community. The only insurance against this kind of economic and social waste is a planned operation whereby the timberlands within a convenient and economical operating radius are managed for continuous production. The planned annual harvest of timber products should be reasonably commensurate with the inherent productivity of the land. A mere balance of growth and drain at some low level of productivity does not suffice. The average annual drain should be roughly in balance with growth when reasonably good management is attained. On lands which have not yet reached that stage, the cut may be somewhat less, or it may even be more. On lands in process of rehabilitation it will be less. In certain stagnant old-growth stands being converted to young growing forests, it may be more. The important feature is the definite plan of cutting which will ultimately place the forest area on a permanent sustained-yield basis.

In the management survey, here reported, lands were classified in the sustained-yield category wherever there was evidence of a planned flow of products in substantially regular quantities on a continuous basis—provided that the planning was definitely recognizable and that the cutting was rated at least fair.

The sustained-yield test was applied only to publicly owned commercial forest land and to private holdings of 5,000 acres and more. (A few of the small private holdings are, no doubt, being managed on a sustained-yield basis, but evidence of a planned cut in regular quantities on a permanent basis is not easily recognized on such small properties.) In other words, the sustained-yield phase of the survey actually covered only about 25 percent of the privately owned lands. These are the lands which have the greater part of the good and high-order cutting. This fact should be kept in mind while considering the figures shown in table 6.

Table 6.—Percent of cutting on a sustained-yield basis

Ownership class	Commercial forest area, million acres	Percent of cutting on sustained yield ^{1/}
Public	116.0	57
National forests	73.5	71
Other Federal	15.4	44
State and local	27.1	23
Private - holdings of		
5,000 acres and more	83.6	28
Medium (only)	32.9	9
Large (only)	50.7	39

^{1/} Weighted in accordance with the number of acres in the property or working circle.

The fact that only 71 percent of the national forests are being cut on a sustained-yield basis is due, in part, to deficient cutting in some of the remote areas of the West. Actually, these lands are receiving good fire protection, the cutting policies have been established, and they are also being managed for other than timber purposes. The failure to qualify in the sustained-yield category is due principally to economic factors such as the lack of access roads or excessive logging costs due to high and rough terrain.

These same conditions are found to some extent on other publicly owned lands and on some of the private lands.

Sustained-yield cutting on privately owned lands has a very encouraging start on the large holdings. The owners of the medium-sized holdings have hardly yet begun sustained-yield cutting. No comparable data for the small holdings were obtained, but the low cutting-practice ratings given to these properties ^{7/}is rather clear evidence that sustained-yield management is a rarity among them.

The degree to which sustained yield has been attained varies considerably as between the North, the South, and the West. On the national forests of the South, all of the cutting is on a sustained-yield basis. In the North, 75 percent of the cutting is on sustained yield, but in the West only 64 percent can so qualify. For the large private holdings (over 50,000 acres) the corresponding break-down is: South 61 percent, North 32 percent, West only 3 percent.

^{7/} See table 2 above.

The survey shows that the better cutting practices and sustained yield go hand in hand. In terms of percents, this relationship is given in table 7.

Table 7.—Percent of cutting on a sustained-yield basis

Ownership	High-order cutting	Good cutting	Fair cutting
National forests	93	68	76
Other Federal	100	61	47
State and local	23	44	35
Private (over 50,000 acres)	98	86	36
Private (5,000 to 50,000 acres)	68	46	16

In the case of large and medium private holdings, the better the cutting practice the more likely that the property is also on sustained yield. Those who practice good or better cutting are truly in the business of growing trees for future as well as present harvest.

Management Status of Commercial Forest Lands

Three major aspects of timber management—cutting practice, fire protection, and sustained yield—have been considered. The specific combination of these that is being applied to any given forest property measures the degree of forest management. The practical difficulties in applying a sustained-yield test to most of the privately owned lands, however, make it impractical to include that factor in our present definition of management grades. The four grades of management which have been set up are based on quality of cutting practices and of fire protection. From highest to lowest, they are as follows:

1. Intensive management requires high-order cutting and good fire protection.

2. Extensive management requires at least fair cutting and fair fire protection.
 - a. Good extensive requires good cutting as a minimum.
 - b. Fair extensive requires fair cutting as a minimum.
3. Without management implies that either the cutting practices or the fire protection, or both, rate poor or worse.
4. Nonoperating area implies that the area is not being operated for timber products.

All commercial forest lands

Thirty-five percent of the commercial forest land is under management. Only 2 percent is intensively managed, 16 percent is under good extensive management, and 17 percent receives only fair extensive management. Table 8 gives the figures for all commercial forest lands.

Table 8.—Management status of commercial forest lands

Ownership	: Commercial : : forest area, : : million acres :	: Percent on various management levels : Inten- : : sive : : Good :	: Extensive : : Fair :	: With- : : out :	: Non- : operating	^{1/}
Total area	461.0	2.1	16.1	17.3	51.9	12.6
Private	345.0	0.6	4.4	18.0	64.6	12.4
Public	116.0	6.6	51.2	15.0	14.0	13.2
National forests	73.5	8.9	60.8	16.7	1.8	11.8
Other Federal	15.4	3.3	30.8	18.5	27.9	19.5
State and local	27.1	2.2	36.8	8.2	39.5	13.3

^{1/} Part of these lands receive fire protection.

Private forest lands

Of the privately owned lands, those held by the large industrial owners show much better management than the lands held by the small nonindustrial and farm owners. Table 9 shows the situation in some detail.

Table 9.—Management status of privately owned commercial forest lands

BY SIZE OF HOLDING

Size or type : Area held :		Percent on various management levels			
of ownership : mil. acres:		Intensive	Extensive	Without	Nonoperating
Small	261.4	0.1	18.0	67.5	14.4
Medium	32.9	0.2	23.8	66.0	10.0
Large	50.7	3.6	44.0	48.4	4.0

BY TYPE OF OWNER

Farm	139.1	0.1	16.9	71.8	11.2
Lumber	36.6	3.4	32.2	58.5	5.9
Pulp	14.8	2.6	66.7	28.2	2.5
Other	154.5	0.2	20.7	63.0	16.1

The three sections of the country show notable differences in percent of private forest land under management (table 10). The North and West rate much higher than the South when both cutting practices and fire protection are considered. As noted previously, it is poor fire protection that lowers the South's rank in forest management.

Table 10.—Percent of privately owned commercial forest land under management and under various combinations of poor practice in the below-extensive-management class

Section	:	:	Below extensive management				:	:
	:Intensive	:	: Low-	: Both	:	:	:	:
	: and	:	: grade	:cutting	: Non	:	:	: Com-
	:extensive	:Low-grade	: fire	:and pro-	:operat-	: All	:mer-	:forest
	:management	:cutting	:protec-	:tection	: ing	:classes	:forest	
	: combined	: <u>1/</u>	:tion <u>2/</u>	:of low	: area	:	: area	
	:	:	:	: grade	:	:	:	
	Percent	Percent	Percent	Percent	Percent	Percent	Mil.acres	
North	28.3	43.2	3.5	13.9	11.1	100.0	139.6	
South	17.3	18.8	14.7	38.7	10.5	100.0	167.0	
West	28.3	39.7	0.6	5.3	26.1	100.0	38.4	
United States	23.0	31.1	8.6	24.9	12.4	100.0	345.0	

1/ Protection "fair" or better.

2/ Cutting "fair" or better.

Throughout the country, it is the small ownerships, both farm and nonfarm, that get the worst treatment. The principal factor that puts these properties on the submanagement level is poor and destructive cutting practices. 8/

National-forest lands

The management status of the national forests is best in the North, where virtually all of the area is under management—26 percent intensive and 74 percent extensive. In this section, however, the national forests contain less than 6 percent of the commercial forest land. In the South they contain 5.5 percent; about 32 percent of this area is intensively managed and about 60 percent is extensively managed. The western national forests include half the commercial forest area of the section. Here the business of intensive management has hardly begun. Less than 2 percent is so treated. A little more than 81 percent is under extensive management. The remaining 17 percent is mostly in nonoperating working circles where cutting has so far been either undesirable or impossible. Most of the extensive management on national forests is on the higher level, which implies cutting practices that are good or better. 9/

8/ For details on this point, see appendix tables 15 and 16.

9/ Further detail on the management status of the national forests is in table 17, Appendix.

Indications of Progress

Specific data on the management status of commercial forest lands have not heretofore been collected. Hence there is little or no basis for a definite measurement of recent progress in forest management throughout the country. A few indications of progress can, however, be found.

In 1938 the Forest Service estimated that only about half of the commercial forest land in the national forests was in a full timber operating status. The brisk wartime demand for all types of forest products has made it possible to shrink the nonoperating commercial forest area of the national forests from about 32 percent in 1938 to about 12 percent in 1945. The bulk of this nonoperating area is in the high mountain areas of the West. In the North and South, the strong demand for timber has enabled the Service to intensify management by various kinds of timber-stand improvement cuttings. The net effect of these influences has been to increase the areas under the better grades of management, so that they now embrace about 86 percent of the commercial forest lands in the national forests.

There are some clear indications that forest management is making progress on the large holdings of lumber and pulp companies. Lands owned by the pulp companies now show indications of management that is not far short of the grade attained by the national forests. The lumber companies have made a substantial beginning--one-third of the area they control is under intensive or extensive management. A considerable number of the large owners are organizing to apply forest management to their lands. It was reported in 1945 that about 500 technical foresters were in the employ of the forest industries. The number is steadily increasing. It is still true, however, that the main job of putting these lands under management has only just begun.

The small private holdings, both farm and nonfarm, show little indication of progress toward timber management. The survey shows that not over 19 percent of the acreage in small holdings is under intensive or extensive management. Small holdings include, however, over half of the total commercial forest acreage and about three-fourths of the private. There are about 4½ million separate holdings. The average size is 62 acres, but three-fourths of the owners hold less than that amount. Only 2 percent own more than 500 acres.

Efforts to improve management have, as yet, had little influence upon the small forest owners. Even the publicly supported fire control programs, on which steady progress has been made in many regions, are notably deficient in the South and the Central

States, where there is the greatest concentration of small owners. Public control of cutting practices is being considered, yet so far there is little of it. Public programs of technical assistance in harvesting and marketing have recently been stepped up, but only enough to scratch the surface. There are several industry programs to promote better practices. Among these are the forestry program of the American Forest Products Industries, the "Tree Farm" and "Keep Green" programs, and the program of the Southern Pulpwood Conservation Association. All these, both public and private, are good so far as they go, but the job of reaching the $4\frac{1}{4}$ million small owners is so enormous that little significant progress is being made in bringing their 261 million acres under management.

The Job Ahead

The management survey opens far too many dismal vistas on the American forest scene. We continue to consume our basic capital in a careless and prodigal manner which can only lead to an ever-tightening saw-timber supply. On net balance, the Nation has been an importer of lumber since 1941. There is little chance that large exports can be resumed in the near future. A huge demand for construction lumber to increase and improve housing and to help set the whole national economy on a high production basis is now upon us. Pulpwood demands are likewise going up. What should be done to meet the situation that confronts us?

We can, of course, follow in the path of least resistance and go on consuming the saw-timber growing stock of the forests until a balance of growth and drain is finally reached at some low level. Other materials can be used for many purposes in place of wood. In comparison with wood, however, these materials generally require a greater expenditure of human and mechanical energy in extracting them from the earth and shaping them for human use. Most of these materials, moreover, are in the category of nonrenewable resources. Intensive exploitation usually implies the necessity to find ways to utilize raw materials of progressively lower grade, with some economic loss. By following such a course we as a Nation would be that much poorer than we might have been had we taken advantage of nature's productive forces in our forest lands. The policy that is more sensible will contribute more to the Nation's wealth and welfare is to nurture the forests in such a way that they will yield wood products in a volume and quality commensurate with needs determined on a reasonably generous basis.

To implement such a policy, it will be necessary to bring most of the commercial forest lands of the United States under management. This does not imply that every acre of forest land must produce to its utmost. There is plenty of margin for the recognition of

economic and physical limitations which make the highest order of management impracticable in many areas. A goal of an annual yield of 20 billion cubic feet of wood including 65 to 72 billion board feet of saw timber^{10/} is considered to be a reasonable objective which can be reached--provided we plan for it on a broad enough front and vigorously adhere to the plans.

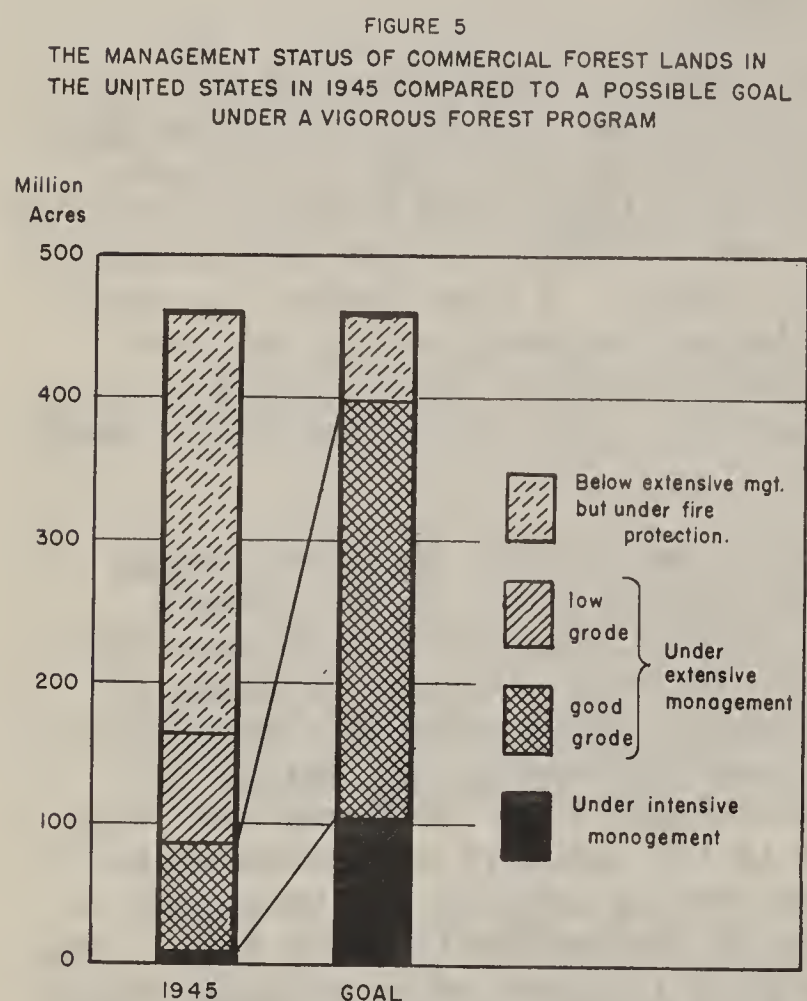
Figure 5 is an attempt to picture the job ahead in quantitative terms. The bar on the left indicates the management status of all commercial forest lands in 1945. The bar on the right gives

a tentative indication of the management status that might reach the sustained-production goal of 20 billion cubic feet annually.

No one knows, of course, just how much acreage should be put under intensive management, how much under extensive management, or how much should remain in a nonoperating status with timber production given second place to some other concurrent but more important use. The combination of management grades depicted should give about the timber yield that is desired. A larger area under intensive management would, of course, yield more timber and thereby permit less-exacting management standards on the remaining lands. There is room for flexibility within the two grades of management but not much room for lands that receive no management at all.

At present, only about 85 million acres out of the total of 460 million are under good

management. Another 80 million acres are under a low grade of extensive management. Ultimately the acreage managed on a reasonably good level could well be 400 million or more.



^{10/} This growth goal is based on estimates given in: U. S. Forest Service. Potential Requirements for Timber Products in the United States. (Reappraisal report). Washington. 1946.

Obviously there is no simple, quick, and easy way to bring such a vast acreage of forest land under good management. At least five major tasks lie ahead. In brief they are:

1. More protection.—About 130 million acres of commercial forest land not yet given the benefit of organized fire protection should have it as soon as possible, according to a Clarke-McNary study made in 1945.^{11/} Further, there is a large acreage now receiving some protection but badly in need of much stronger protection. In the Southeast, West Gulf, and Central regions the need is particularly urgent. In those regions the forest lands are almost entirely in private ownership. They comprise about 40 percent of the Nation's total commercial forest lands. Yet one-half or more of the acreage in each of these regions is now receiving either poor fire protection or none.

Forest insects and diseases, although less conspicuous, now destroy more timber than is lost by fire. Such losses are greatest in the unmanaged and poorly managed forests. Control is difficult because it involves a whole arsenal of technical measures — quarantine, eradication of host plants, use of insecticides and counter-parasites, protective cutting to alter stand composition and to remove vulnerable trees, etc. The existing program, including timber management practices aligned to the protection task, needs to be expanded and intensified.^{12/}

2. More planting.—About 75 million acres of forest land have been so poorly handled in the past that they are now classified as poorly stocked seedling and sapling or deforested areas. Except for certain lands (unusually dry and unfavorable sites in the West and lands used for special purposes such as game habitat or military training grounds), these areas should be restored to a reasonable productivity. As a rule this means planting. The net acreage is about 67 million. Practical considerations, however, make it doubtful that all of this acreage will be considered in any maximum planting program that can now be foreseen.

Larger and quicker returns can, in many cases, be obtained by "interplanting" the openings in existing sparse stands. Given a sufficient period of time and good protection, nature by herself could do this job, but our need for an increased volume of growing stock is good reason for not waiting that long. There are about 23 million acres that would greatly benefit by interplanting.

^{11/} See Appendix B.

^{12/} The subject of forest insects and diseases is treated in detail in another report from the reappraisal of the forest situation.

So far, the forest planting in the United States adds up to less than 5 million acres. The area now in need of planting and of interplanting presents a huge task. Whether it will be done or not depends on how fast we want to move in stepping up the ultimate production of our forest lands.

3. Stand improvement.—One way to lessen the pressure on growing stock, increase the level of management, and still get a reasonable commodity cut from our forest stands is to take as much of the harvest as practicable in the form of poor and partially defective trees. The effect of this would be to leave more of the straight and better trees for future growth toward higher-quality products. Thinnings, weedings, and pruning of young stands will also help increase growth. Much of this timber-stand-improvement work can be carried out in conjunction with the harvesting of the smaller forest products. However, in younger stands, and where pruning is involved, the work usually must be done as a separate undertaking. It has been roughly estimated that about 85 million acres of the younger stands might well be pruned, weeded, or thinned.

4. Waste reduction.—Historically, the harvesting of timber has been a wasteful operation. A large volume of material has been left in the woods, where it clutters the ground, suppresses reproduction, and supplies fuel for destructive fires. In 1944 only about 51 percent of the cubic-foot volume of trees cut appeared in the end products. The remaining 49 percent fell by the wayside as logging and milling waste. This 49 percent included 16 percent used as fuel and 33 percent not used at all.^{13/} There is, of course, no possibility that all of the waste can be utilized. Nevertheless, much can be done to make more complete use of the trees that are cut and to prevent logging waste from menacing the new forest growth. These opportunities are greatest in the Douglas-fir forests of Oregon and Washington, where as much as 11 thousand board feet of sawlog material per acre has been left in the woods.

5. Improved cutting practices.—This is the focal point of the management job ahead. Better protection, more planting and stand improvement, and waste reduction are parts of the over-all problem, but in the main future progress in timber management depends on how 4¼ million private landowners will cut their stands.

Will they do it with an eye to building up and maintaining growing stocks to yield a larger growth for regular harvests? While a number of large owners are now cutting and doubtless will continue

^{13/} The subject of wood waste is treated in another report from the reappraisal of the forest situation.

to cut their lands in accordance with the better practices, the great majority including most of the smaller private owners probably will not do so without outside influence and help. The facts showing the need of such influence and help have been given in this report. What types of help? It is beyond the scope of this discussion to go farther than merely mentioning two types. These are: (1) Effective public control of cutting practices, and (2) more on-the-ground technical assistance to forest-land owners--particularly those with small holdings.

Appendix A

Methods for Applying a Cutting-practice Rating to Forest Land

The fieldmen in the management survey were directed to observe the timber-cutting practices on designated properties and to give each property or working circle a rating based on the criteria set up in the five (high-order, good, fair, poor, destructive) cutting-practice definitions. The next step involves the problem of method whereby the assigned rating is applied to the total forest acreage within an ownership class, a size-of-holding class, or a geographic area. There are three methods by which this may be done.

1. Each timber-cutting operation can be "weighted" in accordance with the acreage contained in the entire property or working circle.
2. Each operation can be weighted by the volume of wood removed within a given period of time.
3. Each operation can be weighted according to the acreage cut over in a given period of time.

The first of these was the principal method used in the survey. It has the advantage of being the easiest to apply in the field. It has two possible weaknesses: (1) On a large property where cutting practices have been on a grade lower than was found in 1945, the entire property is rated in the latest and best practice class. This, however, is probably not very serious. Large operations usually do not change drastically in a short time. Small holdings account for some 75 percent of the private commercial forest area and when these are cut they are usually "cut all over." (2) Another possible disadvantage is that the results relate neither to volume of timber cut nor to area of forest land from which timber is currently being removed. All that can be said, for example, is that the cutting operations on private lands in progress during 1945 rated 36 percent fair and better.

The second method was also applied in the field. It is less time-consuming than the first, but the results are not so reliable. The fact that lands that are heavily cut usually yield a larger single harvest of wood than that which would be taken in repeated lighter cuttings tends to distort the picture by making it seem worse than it really is. Thus a weighting in accordance with volume of wood removed shows only 32 percent cut by fair or better practices. (See tabulation below).

The third method was not attempted in the field because it appeared impractical to measure cut-over area. Theoretically, this last method should yield a percent of "fair" or better cutting in excess of either of those by the other methods. This follows from the probability that good cutting removes less volume per acre during any one cut than poor cutting. In the tabulation below, it is assumed that 5 M board feet per acre are removed under "fair" or better cutting, and 7.5 M board feet per acre under poor to destructive cutting. By dividing the 14 billion board feet cut under fair or better practices by 5 M board feet, the acreage of cut-over area in this class is obtained. Similarly, the acreage of the cut under poor-to-destructive practice is derived. Thus 41 percent is found to represent the acreage cut-over under "fair" or better practice.

Cutting-practice class	Method #1	Method #2	Method #3		
	Weighting by:	Weighting by	Weighting by		
	operating area	volume cut in 1944	cut-over area		
	Percent	Bd. ft. : Per-	Acres	Per-	Assumption
		volume cut: cent:	cut over	cent:	
		(Billions):	(Millions):		
Fair or better	36	14.0 : 32	2.8	41	5 M bd. ft. cut per acre
Poor to destructive	64	30.0 : 68	4.0	59	7.5 M bd.ft. cut per acre
	100	44.0 ^{1/} : 100	6.8	100	

^{1/} Equals 88 percent of total commodity drain of 50 billion board feet; the rest from public lands.

Actually, the difference between the cuts per acre under fair and poor practice may be less than that assumed. Supposing there were no difference: then the 41 percent by the cut-over-area method would be replaced by 32 percent. Probably there is only a small difference, taking the country as a whole. This suggests that 36 percent—the figure obtained by the operating-area method—may be about the right percent of private area being currently cut over annually by fair or better practices.

It may be concluded from the foregoing that the results from the operating-area method may be substituted for those of the other two without undue violence. If this is so, one may say with about equal propriety, for private forest land in the United States:

1. That 36 percent of the cutting rates "fair" or better.
2. That about 36 percent of the current volume of forest products is produced under "fair" or better cutting.
3. That only about 36 percent of the current cut-over area results from "fair" or better cutting.

Appendix B

Explanatory Note on the Differences Between the Results of the Fire Protection Phase of the Management Survey and Those of the Clarke-McNary Study

Possibilities of confusion regarding the results of the fire-protection phase of the management survey and the results of a somewhat similar Forest Service study made in connection with the Clarke-McNary Act program call for this explanatory note.

The two studies were made on different bases. For example, the management survey was concerned only with commercial forest lands and was interested in the quality of protection from a timber-growing standpoint, regardless of whether it was organized or not. The Clarke-McNary study was concerned with all forest lands and some nonforested watersheds in private and nonfederal public ownership which are in need of organized protection. It recognized that some areas, particularly critical watersheds, need more intensive fire control than required for timber growing alone.

In the management survey, a farm was rated "fair" or "good" in fire protection if the owner had maintained his woods in an unburned condition for some time. His woodland may require little effort on his part because of natural fire barriers in the form of cultivated fields and roads. In the Clarke-McNary study, such a farm is included in the category "requiring organized protection but not yet under" if it is surrounded by, or adjacent to, commercial forest lands that are not self-protecting. Most of the farms thus situated are in the Southern and Central States.

Table 11.--Number of private owners of commercial forest land in the United States

and the average size of holding by size of ownership^{1/}, by region, 1945

(Farm and nonfarm combined)

Region	All owners			Small (under 5,000 A.)			Medium (5,000 to 50,000 A.)			Large (over 50,000 A.)		
	Number	Total, thousand acres	Average, acres	Number	Total, thousand acres	Average, acres	Number	Total, thousand acres	Average, acres	Number	Total, thousand acres	Average, acres
New England	243,958	29,294	120	243,719	17,661	72	194	2,150	11,082	45	9,483	210,733
Middle Atlantic	514,908	36,497	71	514,768	32,702	64	115	1,722	14,974	25	2,073	82,920
Lake States	586,472	29,045	50	586,347	24,545	42	91	1,260	13,846	34	3,240	95,294
Central States	987,445	41,770	42	987,353	40,068	41	85	1,185	13,941	7	517	73,857
Plains	121,607	2,990	25	121,607	2,990	25	...	...	...	...	...	...
North	2,454,390	139,596	57	2,453,794	117,966	48	485	6,317	13,025	111	15,313	137,955
South Atlantic	526,056	38,902	74	525,706	33,068	63	312	2,938	9,417	38	2,896	76,211
Southeast	679,306	82,265	121	677,750	58,227	86	1,456	13,799	9,477	100	10,239	102,390
West Gulf	446,564	45,861	103	446,000	30,771	69	483	4,766	9,867	81	10,324	127,457
South	1,651,926	167,028	101	1,649,456	122,066	74	2,251	21,503	9,553	219	23,459	107,119
North Rocky Mountain	20,967	7,352	351	20,930	3,868	185	27	318	11,778	10	3,166	316,600
South Rocky Mountain	7,486	2,957	395	7,383	1,766	239	96	838	8,729	7	353	50,429
Pacific Northwest	72,586	19,757	272	72,390	11,735	162	163	2,526	15,497	33	5,496	166,545
California	18,351	8,283	451	18,184	3,984	219	149	1,414	9,490	18	2,885	160,278
West	119,390	38,349	321	118,887	21,353	180	435	5,096	11,715	68	11,900	175,000
All regions	4,225,706	344,973	82	4,222,137	261,385	62	3,171	32,916	10,380	398	50,672	127,317

^{1/} In the northern and southern regions, 70 percent of the small farm and nonfarm owners have woodlands which do not exceed 50 acres each; 16 percent have holdings which vary in size from 50 to 100 acres, 12 percent vary from 100 to 500, and only 2 percent of the small owners have holdings exceeding 500 acres each.

^{2/} The average size of farm woodlands is 43 acres. About 900 farm woodlands are in the medium size group.

Table 12. - Character of cutting on public commercial forest
lands by sections of the United States

Ownership	:Commercial: : forest : : area, : million : acres	Percent of cutting						: Good : : and : : better:	: Poor : and : worse
		: High- : order	: Good	: Fair	: Poor	: Destruc- : tive			
North:	:	:	:	:	:	:	:	:	:
National forests	: 9.5	: 26	66	8	0	0	:	92	0
Other Federal	: 1.8	: 31	25	39	5	0	:	56	5
State	: 11.9	: 6	72	8	14	0	:	78	14
Local	: 7.5	: 0	28	2	70	0	:	28	70
South:	:	:	:	:	:	:	:	:	:
National forests	: 10.1	: 37	58	5	0	0	:	95	0
Other Federal	: 3.9	: 10	16	27	47	0	:	26	47
State	: 2.0	: 5	42	4	46	3	:	47	49
Local	: .1	: 1	68	10	21	0	:	69	21
West:	:	:	:	:	:	:	:	:	:
National forests	: 53.9	: 2	73	24	1	0	:	75	1
Other Federal	: 9.7	: 0	49	34	16	1	:	49	17
State	: 4.0	: 0	8	33	50	9	:	8	59
Local	: 1.6	: 0	0	12	67	21	:	0	88
United States:	:	:	:	:	:	:	:	:	:
National forests	: 73.5	: 11	69	19	1	0	:	80	1
Other Federal	: 15.4	: 6	57	32	24	1	:	63	25
State	: 17.9	: 4	53	13	27	3	:	57	30
Local	: 9.2	: 0	25	3	70	2	:	25	72

Tsble 13.--Character^{1/} of timber cutting on commercial forest lands in the United States, by ownership and region - 1945

Region	All ownerships						National forest						Other federal						State and local					
	Commercial forest area Thousand acres	Percent of cutting					Commercial forest area Thousand acres	Percent of cutting					Commercial forest area Thousand acres	Percent of cutting					Commercial forest area Thousand acres	Percent in cutting class				
		High order	Good	Fair	Poor	De-structive		High order	Good	Fair	Poor	De-structive		High order	Good	Fair	Poor	De-structive		High order	Good	Fair	Poor	De-structive
New England	30,851	..	10	57	28	5	822	2	56	42	..	..	69	..	100	..	..	..	666	4	76	17	3	..
Middle Atlantic	41,586	3	13	33	45	6	1,265	6	80	14	..	..	211	..	100	..	..	..	3,613	38	38	18	6	..
Lake States	50,345	6	28	12	46	8	5,455	43	55	2	..	..	1,040	45	25	23	7	..	14,805	..	54	3	43	..
Central States	44,213	..	8	12	73	7	1,951	..	94	6	..	..	166	..	67	32	1	..	326	..	83	14	3	..
Plains	3,326	2	4	33	53	8	30	53	47	..	..	..	302	..	..	100	..	..	4	..	..	100	..	..
North	170,321	2	15	26	50	7	9,523	26	66	8	..	..	1,788	31	25	39	5	..	19,414	3	54	5	38	..
South Atlantic	42,923	1	13	30	54	2	2,775	10	70	20	..	..	710	1	26	70	3	..	536	13	53	10	24	..
Southeast	89,390	2	11	24	54	9	3,802	31	69	..	..	..	2,107	15	13	28	44	..	1,216	2	46	4	43	5
West Gulf	50,953	11	15	17	54	3	3,561	64	36	..	..	..	1,123	3	18	5	74	..	408	2	10	..	88	..
South	183,266	4	13	23	54	6	10,138	37	58	5	..	..	3,940	10	16	27	47	..	2,160	4	43	5	45	3
North Rocky Mountain	29,066	3	45	32	19	1	18,061	5	63	30	2	..	1,951	..	55	32	13	..	1,702	..	9	38	52	1
South Rocky Mountain	15,782	..	78	12	8	2	10,765	..	91	9	..	..	1,680	..	95	5	..	..	380	..	31	50	19	..
Pacific Northwest	46,204	..	35	35	23	7	17,341	..	68	31	1	..	5,671	..	39	41	19	1	3,435	..	2	24	57	17
California	16,405	1	40	11	46	2	7,684	2	98	..	..	..	415	..	..	15	47	38	23	..	..	..	..	..
West	107,457	1	45	29	21	4	53,851	2	73	24	1	..	9,717	..	49	34	16	1	5,540	..	6	30	53	11
All regions	461,044	3	20	25	46	6	73,512	11	69	19	1	..	15,445	6	37	32	24	1	27,114	3	44	10	41	2
All private holdings							Small private holdings (under 5,000 acres)						Medium private holdings (5,000 to 50,000 acres)						Large private holdings (over 50,000 acres)					
New England	29,294	..	7	58	29	6	17,661	..	6	40	45	9	2,150	1	8	79	12	..	9,483	..	9	86	5	..
Middle Atlantic	36,497	..	9	35	50	6	32,702	1	10	36	46	7	1,722	1	3	27	65	4	2,073	..	8	14	78	..
Lake States	29,045	..	5	20	60	15	24,545	..	4	19	59	18	1,260	..	4	24	69	3	3,240	..	9	27	64	..
Central States	41,770	..	3	12	77	8	40,068	..	3	12	77	8	1,185	..	..	37	57	6	517	..	4	1	95	..
Plains	2,990	2	4	26	59	9	2,990	2	4	26	59	9	...	..	..	..	..	..	...	..	..	..	..	..
North	139,596	..	6	30	56	8	117,966	..	5	24	61	10	6,317	..	4	47	46	3	15,313	..	9	62	29	..
South Atlantic	38,902	1	7	30	60	2	33,068	..	4	31	63	2	2,938	4	10	38	48	..	2,896	..	44	16	40	..
Southeast	82,265	1	8	25	57	9	58,227	..	2	23	67	8	13,799	..	8	26	48	18	10,239	4	36	36	20	4
West Gulf	45,861	6	13	19	58	4	30,771	..	1	20	75	4	4,766	6	13	19	57	5	10,324	20	44	17	15	4
South	167,028	2	9	25	58	6	122,066	..	2	24	68	6	21,503	2	9	26	50	13	23,459	11	41	25	20	3
North Rocky Mountain	7,352	1	5	34	56	4	3,868	..	2	35	57	6	318	..	13	18	68	1	3,166	2	8	35	53	2
South Rocky Mountain	2,957	..	4	26	55	15	1,766	..	5	37	51	7	838	..	4	10	64	22	353	..	..	36	46	18
Pacific Northwest	19,757	..	6	38	40	16	11,735	..	3	33	48	16	2,526	..	2	37	49	12	5,496	..	11	47	24	18
California	8,283	..	3	18	76	3	3,984	..	2	17	76	5	1,414	..	3	24	67	6	2,885	..	3	15	81	1
West	38,349	..	5	34	50	11	21,353	..	3	32	54	11	5,096	..	3	29	56	12	11,900	..	9	38	43	10
All regions	344,973	1	7	28	56	8	261,385	..	4	25	63	8	32,916	1	7	31	50	11	50,672	5	24	39	28	4
Farm woodlands							Lumber company holdings						Pulp company holdings						Other non-farm holdings					
New England	6,477	1	4	43	44	8	2,349	1	20	29	44	6	6,285	..	9	88	3	..	14,183	..	5	56	31	7
Middle Atlantic	11,854	..	9	38	46	7	1,310	1	5	26	62	6	760	..	14	7	79	..	22,573	1	9	35	49	6
Lake States	13,930	..	4	17	58	21	1,634	..	4	24	70	2	1,564	..	..	29	64	7	11,917	..	6	24	61	9
Central States	25,789	..	3	11	76	10	217	..	7	35	45	13	...	..	..	..	..	..	15,764	..	3	13	80	4
Plains	2,960	1	5	26	59	9	15	..	..	33	67	..	...	..	..	..	..	..	15	..	..	67	33	..
North	61,010	..	5	22	62	11	5,525	1	11	27	56	5	8,609	..	8	72	19	1	64,452	..	6	32	55	7
South Atlantic	23,377	1	4	28	65	2	2,610	..	5	50	42	3	961	..	90	6	4	..	11,954	1	6	31	60	2
Southeast	33,134	..	2	24	66	8	5,959	2	27	26	44	1	2,491	4	72	22	2	..	40,681	..	5	26	56	13
West Gulf	12,549	..	1	17	79	3	7,688	25	43	11	18	3	1,923	20	53	3	24	..	23,701	..	5	25	65	5
South	69,060	..	3	24	68	5	16,257	12	31	23	31	3	5,375	9	68	12	11	..	76,336	1	5	26	59	9
North Rocky Mountain	2,847	..	1	37	58	4	3,527	2	8	24	61	5	...	..	..	..	..	..	978	..	4	62	33	1
South Rocky Mountain	1,498	..	5	16	62	17	1,093	..	1	47	38	14	4	..	..	..	..	..	362	..	3	34	63	..
Pacific Northwest	3,334	1	8	26	38	27	7,401	..	9	38	37	16	844	..	..	54	42	4	8,178	..	1	43	43	13
California	1,309	..	2	7	88	3	2,770	..	3	26	71	..	...	..	..	..	..	..	4,204	..	3	10	80	7
West	8,988	..	4	28	54	14	14,791	..	8	33	48	11	848	..	..	54	42	4	13,722	..	2	39	49	10
All regions	139,058	..	4	23	65	8	36,573	6	19	27	42	6	14,832	3	30	49	17	1	154,510	..	5	30	57	8

^{1/} High-order cutting requires the best types of harvest cutting which will build up and maintain quality and quantity yields consistent with the full productive capacity of the land. Wherever needed, it requires timber stand improvement cuttings, planting, and control of grazing.

Fair cutting marks the beginning of cutting and cultural treatments which will maintain the land with any reasonable stock of growing timber in species that are desirable and marketable.

Destructive cutting leaves the land without timber values and without means for natural reproduction.

Good cutting requires that the cut be made in accordance with good silviculture and that the land be left in possession of desirable species in good condition for future growth. It is substantially better than the class below and should contain some of the elements of the class above.

Poor cutting leaves the land with a limited means for natural reproduction - often in the form of seed trees. In second-growth forests, poor cutting robs the stand of minimum-size merchantable trees in stages of rapid growth. Such cutting often causes deterioration of species with consequent deterioration in both quantity and quality of forest growth.

Table 14.--Character of fire protection on commercial forest lands of the
United States in percent of area, by ownership and region - 1945

Region	All ownerships					National forest					Other federal					State and local				
	Commercial forest area Thousand acres	Percent in each protection grade ^{1/}				Commercial forest area Thousand acres	Percent in each protection grade				Commercial forest area Thousand acres	Percent in each protection grade				Commercial forest area Thousand acres	Percent in each protection grade			
		Good	Fair	Poor	None		Good	Fair	Poor	None		Good	Fair	Poor	None		Good	Fair	Poor	None
New England	30,851	7	93	..	..	822	100	..	..	..	69	..	100	..	..	666	36	64	..	..
Middle Atlantic	41,586	13	82	5	..	1,265	98	2	..	..	211	..	100	..	..	3,613	60	40	..	..
Lake States	50,345	76	21	3	..	5,455	100	..	..	..	1,040	46	54	..	..	14,805	74	26	..	..
Central States	44,213	20	33	29	18	1,951	95	4	1	..	166	96	2	2	..	326	9	83	8	..
Plains	3,326	11	43	34	12	30	100	..	..	..	302	..	..	100	..	4	..	..	100	..
North	170,321	32	53	10	5	9,523	99	1	..	..	1,788	36	47	17	..	19,414	69	31	..	..
South Atlantic	42,923	21	53	21	5	2,775	87	..	13	..	710	11	30	59	..	536	15	31	53	1
Southeast	89,390	6	23	40	31	3,802	79	9	12	..	2,107	24	5	67	4	1,216	9	30	19	42
West Gulf	50,953	13	33	42	12	3,561	93	7	..	..	1,123	24	7	25	44	408	4	6	88	2
South	183,266	11	33	36	20	10,138	86	6	8	..	3,940	22	10	53	15	2,160	10	25	41	24
North Rocky Mountain	29,066	93	4	3	..	18,061	100	..	..	..	1,951	57	35	8	..	1,702	85	9	6	..
South Rocky Mountain	15,782	89	6	4	1	10,765	100	..	..	..	1,680	96	4	..	..	380	73	27	..	..
Pacific Northwest	46,204	81	19	..	..	17,341	100	..	..	..	5,671	69	31	..	..	3,435	70	30	..	..
California	16,405	66	21	13	..	7,684	100	..	..	..	415	60	40	..	..	23	60	40	..	..
West	107,457	83	13	4	..	53,851	100	..	..	..	9,717	71	27	2	..	5,540	75	23	2	..
All regions	461,044	36	35	19	10	73,512	98	1	1	..	15,445	54	25	17	4	27,114	66	28	4	2
		All private holdings				Small private holdings (under 5,000 acres)					Medium private holdings (5,000 to 50,000 acres)					Large private holdings (over 50,000 acres)				
New England	29,294	3	97	..	..	17,661	..	100	..	..	2,150	7	93	..	..	9,483	9	91	..	..
Middle Atlantic	36,497	6	89	5	..	32,702	6	89	5	..	1,722	1	91	8	..	2,073	6	89	5	..
Lake States	29,045	73	22	5	..	24,545	69	25	6	..	1,260	94	6	..	..	3,240	97	3	..	..
Central States	41,770	16	34	31	19	40,068	16	34	31	19	1,185	1	63	35	1	517	..	25	61	14
Plains	2,990	11	47	28	14	2,990	11	47	28	14	..	..	..	..	..	..	..	..	..	..
North	139,596	22	60	12	6	117,966	22	57	14	7	6,317	21	70	9	..	15,313	27	70	3	..
South Atlantic	38,902	16	57	21	6	33,068	18	62	15	5	2,938	6	36	41	17	2,896	2	29	69	..
Southeast	82,265	2	24	41	33	58,227	2	22	42	34	13,799	2	26	37	35	10,239	5	31	42	22
West Gulf	45,861	7	36	45	12	30,771	2	37	47	14	4,766	1	41	42	16	10,324	22	32	42	4
South	167,028	7	35	37	21	122,066	6	36	36	22	21,503	2	31	38	29	23,459	12	31	46	11
North Rocky Mountain	7,352	85	5	10	..	3,868	77	7	16	..	318	68	14	18	..	3,166	98	1	1	..
South Rocky Mountain	2,957	45	29	22	4	1,766	52	35	9	4	838	29	16	48	7	353	45	31	24	..
Pacific Northwest	19,757	70	30	..	..	11,735	68	32	..	..	2,526	67	33	..	..	5,496	76	24	..	..
California	8,283	35	38	27	..	3,984	33	43	24	..	1,414	25	26	49	..	2,885	43	39	18	..
West	38,349	64	27	9	..	21,353	62	30	8	..	5,096	49	27	23	1	11,900	73	22	5	..
All regions	344,973	19	44	24	13	261,385	18	45	24	13	32,916	13	38	30	19	50,672	31	41	23	5

^{1/} Good protection is required to meet the standard of that which is given to the better protected public and private lands. A good rating does not necessarily imply that the protection is all that is desirable. It is merely the best that has so far been attained on any considerable area.

Poor protection implies some measure of protection but notably less than that required to meet the Clarke-McNary program standard.

Fair protection is that which reasonably conforms to the standards set up by the Clarke-McNary Act program for State and private lands but not substantially exceeding them. These standards are defined in terms of maximum allowable annual burn.

No protection means just that.

Table 15.--Management status^{1/} of commercial forest lands in the United States, by ownership and region - 1945

Region	All ownerships					All private holdings					Farm woodlands				
	Commercial forest area Thousand acres	Percent on various management levels				Commercial forest area Thousand acres	Percent on various management levels				Commercial forest area Thousand acres	Percent on various management levels			
		Intensive	Extensive	Without	Non-operating		Intensive	Extensive	Without	Non-operating		Intensive	Extensive	Without	Non-operating
New England	30,851	0.2	64.9	32.0	2.9	29,294	0.1	63.8	33.6	2.5	6,477	...	46.3	51.2	2.5
Middle Atlantic	41,586	1.8	34.4	39.9	23.9	36,497	0.3	33.5	45.2	21.0	11,854	0.3	38.1	45.6	16.0
Lake States	50,345	5.2	35.3	47.7	11.8	29,045	0.2	19.0	60.7	20.1	13,930	0.2	16.8	68.8	14.2
Central States	44,213	...	10.1	87.1	2.8	41,770	...	5.1	92.0	2.9	25,789	...	5.3	91.4	3.3
Plains	3,326	1.8	23.2	75.0	...	2,990	1.5	25.3	73.2	...	2,960	1.5	25.1	73.4	...
North	170,321	2.0	33.7	53.7	10.6	139,596	0.2	28.1	60.6	11.1	61,010	0.2	19.6	72.2	8.0
South Atlantic	42,923	0.2	27.7	59.5	12.6	38,902	0.1	24.0	63.0	12.9	23,377	0.1	23.1	62.4	14.4
Southeast	89,390	1.9	15.0	76.9	6.2	82,265	0.5	12.6	80.3	6.6	33,134	...	9.7	83.0	7.3
West Gulf	50,953	6.9	17.5	61.4	14.2	45,861	3.0	16.0	65.6	15.4	12,549	...	7.0	73.5	19.5
South	183,266	2.9	18.7	68.5	9.9	167,028	1.1	16.2	72.2	10.5	69,060	...	13.8	74.3	11.9
North Rocky Mountain	29,066	3.0	69.4	19.0	8.6	7,352	0.8	36.9	58.5	3.8	2,847	...	35.0	59.2	5.8
South Rocky Mountain	15,782	...	72.3	8.5	19.2	2,957	...	16.3	43.6	40.1	1,498	...	12.9	60.5	26.6
Pacific Northwest	46,204	...	59.7	25.9	14.4	19,757	0.1	34.9	43.8	21.2	3,334	0.3	23.2	44.4	32.1
California	16,405	0.3	19.7	20.0	60.0	8,283	...	8.3	39.1	52.6	1,309	...	3.0	31.7	65.3
West	107,457	0.9	58.1	20.5	20.5	38,349	0.2	28.1	45.6	26.1	8,988	0.1	22.3	49.9	27.7
All regions	461,044	2.1	33.4	51.9	12.6	344,973	0.6	22.4	64.6	12.4	139,058	0.1	16.9	71.8	11.2
Lumber company holdings					Pulp company holdings					Other non-farm holdings					
New England	2,349	...	49.6	49.3	1.1	6,285	...	97.4	2.6	...	14,183	0.1	59.3	36.8	3.8
Middle Atlantic	1,310	1.0	26.8	57.7	14.5	760	...	21.3	78.7	...	22,573	0.3	31.9	43.1	24.7
Lake States	1,634	...	28.5	71.5	...	1,564	...	17.0	59.8	23.2	11,917	0.1	20.6	50.0	29.3
Central States	217	...	4.6	95.4	...	...	...	...	...	...	15,764	...	4.7	93.0	2.3
Plains	15	...	33.3	66.7	...	...	...	...	...	...	15	...	66.7	33.3	...
North	5,525	0.2	36.1	59.8	3.9	8,609	...	76.1	19.7	4.2	64,452	0.1	29.2	55.2	15.5
South Atlantic	2,610	...	36.2	63.4	0.4	961	...	17.1	82.9	...	11,954	0.2	23.7	62.4	13.7
Southeast	5,959	1.5	18.1	78.1	2.3	2,491	4.1	64.0	31.9	...	40,681	0.5	11.0	81.4	7.1
West Gulf	7,688	14.1	32.8	50.5	2.6	1,923	14.7	58.7	26.6	...	23,701	...	11.9	69.5	18.6
South	16,257	7.2	28.0	62.7	2.1	5,375	7.2	53.7	39.1	...	76,336	0.3	13.2	74.7	11.8
North Rocky Mountain	3,527	1.7	30.4	64.7	3.2	...	...	...	...	...	978	...	65.7	34.3	...
South Rocky Mountain	1,093	...	19.7	23.0	57.3	4	...	...	...	100.0	362	...	20.8	35.7	43.5
Pacific Northwest	7,401	...	46.2	52.7	1.1	844	...	54.0	46.0	...	8,178	...	27.5	35.3	37.2
California	2,770	...	18.1	53.3	28.6	...	...	...	...	...	4,204	...	3.5	32.1	64.4
West	14,791	0.4	35.3	53.4	10.9	848	...	53.9	45.6	0.5	13,722	...	22.7	34.2	43.1
All regions	36,573	3.4	32.2	58.5	5.9	14,832	2.6	66.7	28.2	2.5	154,510	0.2	20.7	63.0	16.1
Small private holdings (under 5,000 acres)					Medium private holdings (5,000 to 50,000 acres)					Large private holdings (over 50,000 acres)					
New England	17,661	...	44.5	51.9	3.6	2,150	0.8	82.2	11.9	5.1	9,483	...	95.5	4.5	...
Middle Atlantic	32,702	0.3	35.2	42.2	22.3	1,722	0.8	23.9	59.9	15.4	2,073	...	15.8	79.7	4.5
Lake States	24,545	0.2	16.8	60.6	22.4	1,260	...	23.8	62.9	13.3	3,240	...	34.1	61.2	4.7
Central States	40,068	...	4.1	92.9	3.0	1,185	...	36.9	63.1	...	517	...	5.0	95.0	...
Plains	2,990	1.5	25.3	73.2	...	...	...	...	...	...	...	...	...	...	...
North	117,966	0.2	21.9	65.5	12.4	6,317	0.5	46.1	44.8	8.6	15,313	...	68.7	29.7	1.6
South Atlantic	33,068	...	24.5	61.6	13.9	2,938	0.6	25.6	64.8	9.0	2,896	...	17.5	77.6	4.9
Southeast	58,227	...	8.7	83.3	8.0	13,799	...	16.9	78.5	4.6	10,239	3.9	28.9	65.5	1.7
West Gulf	30,771	...	10.5	69.6	19.9	4,766	...	15.4	70.8	13.8	10,324	13.2	32.7	51.4	2.7
South	122,066	...	13.4	74.0	12.6	21,503	0.1	17.7	74.9	7.3	23,459	7.5	29.1	60.8	2.5
North Rocky Mountain	3,868	...	33.3	61.3	5.4	318	...	24.2	54.1	21.7	3,166	1.8	42.6	55.6	...
South Rocky Mountain	1,766	...	18.3	28.6	53.1	838	...	7.6	73.3	19.1	353	...	27.2	47.9	24.9
Pacific Northwest	11,735	0.1	24.6	43.3	32.0	26	...	33.8	51.7	14.5	5,496	...	57.7	41.1	1.2
California	3,984	...	5.5	26.6	9	14	...	9.1	47.9	43.0	2,885	...	11.7	52.1	36.2
West	21,353	0.1	22.1	42.2	36.6	2,096	...	22.0	54.4	23.6	11,900	0.5	41.6	47.8	10.1
All regions	261,385	0.1	18.0	67.5	14.4	32,916	...	23.7	66.3	10.0	50,672	3.7	44.0	48.4	3.9
National forests					Other federal holdings					State and local lands					
New England	822	1.7	97.4	...	0.9	69	...	18.6	...	81.2	666	3.2	80.5	2.8	13.5
Middle Atlantic	1,265	6.2	93.2	...	0.6	211	...	16.1	...	83.9	3,613	15.5	23.2	2.4	58.9
Lake States	5,455	42.9	57.1	...	...	1,040	19.9	71.2	6.7	2.2	14,805	...	56.8	42.6	0.6
Central States	1,951	...	99.0	1.0	...	166	...	69.9	0.6	29.5	326	...	88.0	10.8	1.2
Plains	30	53.3	46.7	...	...	302	...	...	100.0	...	4	...	...	100.0	...
North	9,523	25.7	73.9	0.4	0.2	1,788	11.6	50.4	20.8	17.1	19,414	3.0	51.9	33.2	11.9
South Atlantic	2,775	1.1	83.7	12.8	2.4	710	0.7	12.8	53.1	33.4	536	5.4	21.3	55.4	17.9
Southeast	3,802	26.9	61.7	11.4	...	2,107	12.3	13.8	69.0	4.9	1,216	1.5	36.0	62.4	0.1
West Gulf	3,561	60.8	39.2	...	...	1,123	1.1	12.7	81.3	4.9	408	1.5	6.6	61.8	30.1
South	10,138	31.7	59.9	7.7	0.7	3,940	7.0	13.3	69.7	10.0	2,160	2.5	26.8	60.5	10.2
North Rocky Mountain	18,061	4.5	87.5	1.7	6.3	1,951	...	53.5	8.3	38.2	1,702	...	36.0	43.6	20.4
South Rocky Mountain	10,765	...	88.8	...	11.2	1,680	...	66.8	...	33.2	380	...	66.6	15.5	17.9
Pacific Northwest	17,341	...	91.9	1.1	7.0	5,671	...	71.1	18.1	10.8	3,435	...	21.1	60.6	18.3
California	7,684	0.6	33.1	...	66.3	415	...	1.9	10.9	87.2	23	...	...	...	100.0
West	53,851	1.6	81.4	0.9	16.1	9,717	...	63.8	12.7	23.5	5,540	...	28.7	52.0	19.3
All regions	73,512	8.9	77.5	1.8	11.8	15,445	3.3	49.3	27.9	19.5	27,114	2.2	45.0	39.5	13.3

^{1/} In percent of commercial forest area

Intensive management - requires high order cutting and good fire protection
 Extensive management - requires at least fair cutting and fair fire protection
 Without management - implies that either the cutting practices or the fire protection, or both together, are poor or worse
 Non-operating area - areas not being operated for timber products.

Table 16. - Summary of the management status of commercial forest area in the United States, by type of private ownership - 1945

Owner	Intensive management		Extensive management		Below extensive management			All classes	Commercial forest area
	Percent	Percent	Percent	Percent	Percent	Percent			
Private:									
Small	0.1	18.0	67.5	14.4	100.0	261.4			
Medium	0.2	23.8	66.0	10.0	100.0	32.9			
Large	3.6	44.0	48.4	4.0	100.0	50.7			
Farm	0.1	16.9	71.8	11.2	100.0	139.1			
Lumber	3.4	32.2	58.5	5.9	100.0	36.6			
Pulp	2.6	66.7	28.2	2.5	100.0	14.8			
Other	0.2	20.7	63.0	16.1	100.0	154.5			
All private	0.6	22.4	64.8	12.4	100.0	345.0			
Public	6.6	66.2	14.0	13.2	100.0	116.0			
All owners	2.1	33.4	51.9	12.6	100.0	461.0			

Table 17. - Summary of the management status of national-forest commercial forest area, by sections of the United States - 1945

Sections	National Forests									
	All		Commercial forest area		Percent of all:		Intensive management:		Extensive management:	
	forest area		forest area		commercial forest area		forest area		forest area	
	Million acres	Percent	Million acres	Percent	Percent	Percent	Percent	Percent	Percent	Percent
North	170.3	9.5	5.6	25.7	73.9	0.4	100.0			
South	183.3	10.1	5.5	31.7	59.9	8.4	100.0			
West	107.4	53.9	50.2	1.6	81.4	17.0	100.0			
United States	461.0	73.5	16.0	8.9	77.5	13.6	100.0			

^{1/} Mostly nonoperating areas of working circles where cutting has not yet been possible or desirable.

Date	Description	Amount		Balance
		To	By	
1890 Jan 1	Balance forward			100.00
1890 Jan 15	Received from A. B.	50.00		150.00
1890 Feb 1	Received from C. D.	25.00		175.00
1890 Feb 15	Received from E. F.	10.00		185.00
1890 Mar 1	Received from G. H.	30.00		215.00
1890 Mar 15	Received from I. J.	15.00		230.00
1890 Apr 1	Received from K. L.	20.00		250.00
1890 Apr 15	Received from M. N.	10.00		260.00
1890 May 1	Received from O. P.	15.00		275.00
1890 May 15	Received from Q. R.	25.00		300.00
1890 Jun 1	Received from S. T.	10.00		310.00
1890 Jun 15	Received from U. V.	20.00		330.00
1890 Jul 1	Received from W. X.	15.00		345.00
1890 Jul 15	Received from Y. Z.	25.00		370.00
1890 Aug 1	Received from A. B.	10.00		380.00
1890 Aug 15	Received from C. D.	20.00		400.00
1890 Sep 1	Received from E. F.	15.00		415.00
1890 Sep 15	Received from G. H.	25.00		440.00
1890 Oct 1	Received from I. J.	10.00		450.00
1890 Oct 15	Received from K. L.	20.00		470.00
1890 Nov 1	Received from M. N.	15.00		485.00
1890 Nov 15	Received from O. P.	25.00		510.00
1890 Dec 1	Received from Q. R.	10.00		520.00
1890 Dec 15	Received from S. T.	20.00		540.00
1891 Jan 1	Received from U. V.	15.00		555.00
1891 Jan 15	Received from W. X.	25.00		580.00
1891 Feb 1	Received from Y. Z.	10.00		590.00
1891 Feb 15	Received from A. B.	20.00		610.00
1891 Mar 1	Received from C. D.	15.00		625.00
1891 Mar 15	Received from E. F.	25.00		650.00
1891 Apr 1	Received from G. H.	10.00		660.00
1891 Apr 15	Received from I. J.	20.00		680.00
1891 May 1	Received from K. L.	15.00		695.00
1891 May 15	Received from M. N.	25.00		720.00
1891 Jun 1	Received from O. P.	10.00		730.00
1891 Jun 15	Received from Q. R.	20.00		750.00
1891 Jul 1	Received from S. T.	15.00		765.00
1891 Jul 15	Received from U. V.	25.00		790.00
1891 Aug 1	Received from W. X.	10.00		800.00
1891 Aug 15	Received from Y. Z.	20.00		820.00
1891 Sep 1	Received from A. B.	15.00		835.00
1891 Sep 15	Received from C. D.	25.00		860.00
1891 Oct 1	Received from E. F.	10.00		870.00
1891 Oct 15	Received from G. H.	20.00		890.00
1891 Nov 1	Received from I. J.	15.00		905.00
1891 Nov 15	Received from K. L.	25.00		930.00
1891 Dec 1	Received from M. N.	10.00		940.00
1891 Dec 15	Received from O. P.	20.00		960.00
1892 Jan 1	Received from Q. R.	15.00		975.00
1892 Jan 15	Received from S. T.	25.00		1000.00
1892 Feb 1	Received from U. V.	10.00		1010.00
1892 Feb 15	Received from W. X.	20.00		1030.00
1892 Mar 1	Received from Y. Z.	15.00		1045.00
1892 Mar 15	Received from A. B.	25.00		1070.00
1892 Apr 1	Received from C. D.	10.00		1080.00
1892 Apr 15	Received from E. F.	20.00		1100.00
1892 May 1	Received from G. H.	15.00		1115.00
1892 May 15	Received from I. J.	25.00		1140.00
1892 Jun 1	Received from K. L.	10.00		1150.00
1892 Jun 15	Received from M. N.	20.00		1170.00
1892 Jul 1	Received from O. P.	15.00		1185.00
1892 Jul 15	Received from Q. R.	25.00		1210.00
1892 Aug 1	Received from S. T.	10.00		1220.00
1892 Aug 15	Received from U. V.	20.00		1240.00
1892 Sep 1	Received from W. X.	15.00		1255.00
1892 Sep 15	Received from Y. Z.	25.00		1280.00
1892 Oct 1	Received from A. B.	10.00		1290.00
1892 Oct 15	Received from C. D.	20.00		1310.00
1892 Nov 1	Received from E. F.	15.00		1325.00
1892 Nov 15	Received from G. H.	25.00		1350.00
1892 Dec 1	Received from I. J.	10.00		1360.00
1892 Dec 15	Received from K. L.	20.00		1380.00
1893 Jan 1	Received from M. N.	15.00		1395.00
1893 Jan 15	Received from O. P.	25.00		1420.00
1893 Feb 1	Received from Q. R.	10.00		1430.00
1893 Feb 15	Received from S. T.	20.00		1450.00
1893 Mar 1	Received from U. V.	15.00		1465.00
1893 Mar 15	Received from W. X.	25.00		1490.00
1893 Apr 1	Received from Y. Z.	10.00		1500.00
1893 Apr 15	Received from A. B.	20.00		1520.00
1893 May 1	Received from C. D.	15.00		1535.00
1893 May 15	Received from E. F.	25.00		1560.00
1893 Jun 1	Received from G. H.	10.00		1570.00
1893 Jun 15	Received from I. J.	20.00		1590.00
1893 Jul 1	Received from K. L.	15.00		1605.00
1893 Jul 15	Received from M. N.	25.00		1630.00
1893 Aug 1	Received from O. P.	10.00		1640.00
1893 Aug 15	Received from Q. R.	20.00		1660.00
1893 Sep 1	Received from S. T.	15.00		1675.00
1893 Sep 15	Received from U. V.	25.00		1700.00
1893 Oct 1	Received from W. X.	10.00		1710.00
1893 Oct 15	Received from Y. Z.	20.00		1730.00
1893 Nov 1	Received from A. B.	15.00		1745.00
1893 Nov 15	Received from C. D.	25.00		1770.00
1893 Dec 1	Received from E. F.	10.00		1780.00
1893 Dec 15	Received from G. H.	20.00		1800.00
1894 Jan 1	Received from I. J.	15.00		1815.00
1894 Jan 15	Received from K. L.	25.00		1840.00
1894 Feb 1	Received from M. N.	10.00		1850.00
1894 Feb 15	Received from O. P.	20.00		1870.00
1894 Mar 1	Received from Q. R.	15.00		1885.00
1894 Mar 15	Received from S. T.	25.00		1910.00
1894 Apr 1	Received from U. V.	10.00		1920.00
1894 Apr 15	Received from W. X.	20.00		1940.00
1894 May 1	Received from Y. Z.	15.00		1955.00
1894 May 15	Received from A. B.	25.00		1980.00
1894 Jun 1	Received from C. D.	10.00		1990.00
1894 Jun 15	Received from E. F.	20.00		2010.00
1894 Jul 1	Received from G. H.	15.00		2025.00
1894 Jul 15	Received from I. J.	25.00		2050.00
1894 Aug 1	Received from K. L.	10.00		2060.00
1894 Aug 15	Received from M. N.	20.00		2080.00
1894 Sep 1	Received from O. P.	15.00		2095.00
1894 Sep 15	Received from Q. R.	25.00		2120.00
1894 Oct 1	Received from S. T.	10.00		2130.00
1894 Oct 15	Received from U. V.	20.00		2150.00
1894 Nov 1	Received from W. X.	15.00		2165.00
1894 Nov 15	Received from Y. Z.	25.00		2190.00
1894 Dec 1	Received from A. B.	10.00		2200.00
1894 Dec 15	Received from C. D.	20.00		2220.00
1895 Jan 1	Received from E. F.	15.00		2235.00
1895 Jan 15	Received from G. H.	25.00		2260.00
1895 Feb 1	Received from I. J.	10.00		2270.00
1895 Feb 15	Received from K. L.	20.00		2290.00
1895 Mar 1	Received from M. N.	15.00		2305.00
1895 Mar 15	Received from O. P.	25.00		2330.00
1895 Apr 1	Received from Q. R.	10.00		2340.00
1895 Apr 15	Received from S. T.	20.00		2360.00
1895 May 1	Received from U. V.	15.00		2375.00
1895 May 15	Received from W. X.	25.00		2400.00
1895 Jun 1	Received from Y. Z.	10.00		2410.00
1895 Jun 15	Received from A. B.	20.00		2430.00
1895 Jul 1	Received from C. D.	15.00		2445.00
1895 Jul 15	Received from E. F.	25.00		2470.00
1895 Aug 1	Received from G. H.	10.00		2480.00
1895 Aug 15	Received from I. J.	20.00		2500.00
1895 Sep 1	Received from K. L.	15.00		2515.00
1895 Sep 15	Received from M. N.	25.00		2540.00
1895 Oct 1	Received from O. P.	10.00		2550.00
1895 Oct 15	Received from Q. R.	20.00		2570.00
1895 Nov 1	Received from S. T.	15.00		2585.00
1895 Nov 15	Received from U. V.	25.00		2610.00
1895 Dec 1	Received from W. X.	10.00		2620.00
1895 Dec 15	Received from Y. Z.	20.00		2640.00
1896 Jan 1	Received from A. B.	15.00		2655.00
1896 Jan 15	Received from C. D.	25.00		2680.00
1896 Feb 1	Received from E. F.	10.00		2690.00
1896 Feb 15	Received from G. H.	20.00		2710.00
1896 Mar 1	Received from I. J.	15.00		2725.00
1896 Mar 15	Received from K. L.	25.00		2750.00
1896 Apr 1	Received from M. N.	10.00		2760.00
1896 Apr 15	Received from O. P.	20.00		2780.00
1896 May 1	Received from Q. R.	15.00		2795.00
1896 May 15	Received from S. T.	25.00		2820.00
1896 Jun 1	Received from U. V.	10.00		2830.00
1896 Jun 15	Received from W. X.	20.00		2850.00
1896 Jul 1	Received from Y. Z.	15.00		2865.00
1896 Jul 15	Received from A. B.	25.00		2890.00
1896 Aug 1	Received from C. D.	10.00		2900.00
1896 Aug 15	Received from E. F.	20.00		2920.00
1896 Sep 1	Received from G. H.	15.00		2935.00
1896 Sep 15	Received from I. J.	25.00		2960.00
1896 Oct 1	Received from K. L.	10.00		2970.00
1896 Oct 15	Received from M. N.	20.00		2990.00
1896 Nov 1	Received from O. P.	15.00		3005.00
1896 Nov 15	Received from Q. R.	25.00		3030.00
1896 Dec 1	Received from S. T.	10.00		3040.00
1896 Dec 15	Received from U. V.	20.00		3060.00
1897 Jan 1	Received from W. X.	15.00		3075.00
1897 Jan 15	Received from Y. Z.	25.00		3100.00
1897 Feb 1	Received from A. B.	10.00		3110.00
1897 Feb 15	Received from C. D.	20.00		3130.00
1897 Mar 1	Received from E. F.	15.00		3145.00
1897 Mar 15	Received from G. H.	25.00		3170.00
1897 Apr 1	Received from I. J.	10.00		3180.00
1897 Apr 15	Received from K. L.	20.00		3200.00
1897 May 1	Received from M. N.	15.00		3215.00
1897 May 15	Received from O. P.	25.00		3240.00
1897 Jun 1	Received from Q. R.	10.00		3250.00
1897 Jun 15	Received from S. T.	20.00		3270.00
1897 Jul 1	Received from U. V.	15.00		3285.00
1897 Jul 15	Received from W. X.	25.00		3310.00
1897 Aug 1	Received from Y. Z.	10.00		3320.00
1897 Aug 15	Received from A. B.	20.00		3340.00
1897 Sep 1	Received from C. D.	15.00		3355.00
1897 Sep 15	Received from E. F.	25.00		3380.00
1897 Oct 1	Received from G. H.	10.00		3390.00
1897 Oct 15	Received from I. J.	20.00		3410.00
1897 Nov 1	Received from K. L.	15.00		3425.00
1897 Nov 15	Received from M. N.	25.00		3450.00
1897 Dec 1	Received from O. P.	10.00		3460.00
1897 Dec 15	Received from Q. R.	20.00		3480.00
1898 Jan 1	Received from S. T.	15.00		3495.00
1898 Jan 15	Received from U. V.	25.00		3520.00
1898 Feb 1	Received from W. X.	10.00		3530.00
1898 Feb 15	Received from Y. Z.	20.00		3550.00
1898 Mar 1	Received from A. B.	15.00		3565.00
1898 Mar 15	Received from C. D.	25.00		3590.00
1898 Apr 1	Received from E. F.	10.00		3600.00
1898 Apr 15	Received from G. H.	20.00		3620.00
1898 May 1	Received from I. J.	15.00		3635.00
1898 May 15	Received from K. L.	25.00		3660.00
1898 Jun 1	Received from M. N.	10.00		3670.00
1898 Jun 15	Received from O. P.	20.00		3690.00
1898 Jul 1	Received from Q. R.	15.00		3705.00
1898 Jul 15	Received from S. T.	25.00		3730.00
1898 Aug 1	Received from U. V.	10.00		3740.00
1898 Aug 15	Received from W. X.	20.00		3760.00
1898 Sep 1	Received from Y. Z.	15.00		3775.00
1898 Sep 15	Received from A. B.	25.00		3800.00
1898 Oct 1	Received from C. D.	10.00		3810.00
1898 Oct 15	Received from E. F.	20.00		3830.00
1898 Nov 1	Received from G. H.	15.00		3845.00
1898 Nov 15	Received from I. J.	25.00		3870.00
1898 Dec 1	Received from K. L.	10.00		3880.00
1898 Dec 15	Received from M. N.	20.00		3900.00
1899 Jan 1	Received from O. P.	15.00		3915.00
1899 Jan 15	Received from Q. R.	25.00		3940.00
1899 Feb 1	Received from S. T.	10.00		3950.00
1899 Feb 15	Received from U. V.	20.00		3970.00
1899 Mar 1	Received from W. X.	15.00		3985.00
1899 Mar 15	Received from Y. Z.	25.00		4010.00
1899 Apr 1	Received from A. B.	10.00		4020.00
1899 Apr 15	Received from C. D.	20.00		4040.00
1899 May 1	Received from E. F.	15.00		4055.00
1899 May 15	Received from G. H.	25.0		

